

AMENDMENTS TO THE CLAIMS

Please amend claims 1,-5, 9, 18 and 29, as follows:

1. (currently amended): A millimeter- and submillimeter-wave noise apparatus comprising:
means for generating millimeter- and submillimeter- wave noise, without an oscillator,
wherein said millimeter- and submillimeter- wave noise comprises a ~~spectral~~ continuum of
random noise in the range between 110 and about 400 GHz; and
a transmission structure.
2. (currently amended): The apparatus of claim 1 wherein said millimeter- and
submillimeter- wave noise further comprises one or more ~~spectral~~ frequency bands in the range
between about 60 to 110 GHz.
3. (currently amended): The apparatus of claim 2 wherein said millimeter- and
submillimeter- wave noise spectrum is continuous across a range of frequencies from about 60 to
about 400 GHz.
4. (currently amended): The apparatus of claim 1 wherein said means for generating said
millimeter- and submillimeter- wave noise comprises a frequency multiplier for converting
microwave noise into said noise.
5. (currently amended): The apparatus of claim 1 wherein said means for generating said
millimeter- and submillimeter- wave noise comprises a harmonic mixer.
6. (original): The apparatus of claim 1 wherein said apparatus is portable.
7. (original): A spectrometer comprising the apparatus of claim 3.
8. (original): The spectrometer of claim 7 wherein said spectrometer is a Fourier Transform
Spectrometer.
9. (currently amended): A method of producing millimeter- and submillimeter-wave noise,
without an oscillator, comprising:

generating a first noise band; and

converting said first noise band into a second noise band, wherein said second noise band comprises a ~~spectral~~ continuum of random millimeter- and submillimeter-wave noise.

10. (original): The method of claim 9 wherein said second noise band is continuous across a range of frequencies from about 60 to about 400 GHz.

11. (original): The method of claim 9 wherein said second noise band is continuous across a range of frequencies from about 60 GHz to about 1 THz.

12. (original): The method of claim 9 wherein said first noise band comprises noise of frequencies between about 0.1 to about 60 GHz.

13. (original): The method of claim 9 further comprising adjusting said first noise band to a designated power level prior to said converting step.

14. (original): The method of claim 13 wherein said converting step comprises inputting said adjusted first noise band into a frequency multiplier, wherein said designated power level is a maximum safe input power level of said frequency multiplier.

15. (original): The method of claim 13 wherein said adjusting step comprises amplifying a power of said first noise band.

16. (original): The method of claim 13 wherein said adjusting step comprises attenuating a power of said first noise band.

17. (original): The method of claim 9 further comprising directing said second band of noise toward a destination.

18. (currently amended): A millimeter- and submillimeter-wave noise generating apparatus comprising:

a microwave noise source for generating microwave noise;

means for adjusting a power of said microwave noise source to a designated level; and

a frequency multiplier for converting said adjusted microwave noise into a continuum of millimeter- and submillimeter-wave noise, wherein said designated level is a maximum safe input level of said frequency multiplier and wherein the millimeter and submillimeter noise is generated without an oscillator.

19. (original): The apparatus of claim 18 wherein said means for adjusting comprises one or more microwave amplifiers.
20. (original): The apparatus of claim 19 wherein said means for adjusting further comprises a level-set attenuator.
21. (original): The apparatus of claim 18 wherein said millimeter- and submillimeter-wave noise is continuous across a frequency range of about 60 GHz to about 400 GHz.
22. (original): The apparatus of claim 18 wherein said millimeter- and submillimeter-wave noise is continuous across a frequency range of about 60 GHz to about 1 THz.
23. (original): The apparatus of claim 18 further comprising a transmission structure coupled to an output of said frequency multiplier for directing said millimeter- and submillimeter-wave noise.
24. (original): The apparatus of claim 18 wherein said microwave noise source is selected from the group consisting of: a diode noise source, a noise tube, and a thermal noise source.
25. (original): The apparatus of claim 18 wherein said frequency multiplier is a semiconductor diode multiplier.
26. (original): The apparatus of claim 18 wherein said apparatus is portable.
27. (original): The apparatus of claim 18 further comprising one or more band-pass filters coupled to said frequency multiplier to create one or more discrete millimeter- and submillimeter-wave noise bands.
28. (original): A spectrometer comprising said apparatus of claim 18.

29. (currently amended): A method for generating millimeter and submillimeter-wave noise power, without an oscillator, comprising:
- producing microwave noise power;
 - amplifying said microwave noise power into amplified noise power; adjusting said amplified noise power to a designated power level; and
 - converting said adjusted noise power to a continuum of millimeter- and submillimeter-wave noise through a frequency multiplier, wherein said designated power level is the maximum safe input level of said frequency multiplier.
30. (original): The method of claim 29 further comprising testing millimeter- and submillimeter-wave components using said millimeter- and submillimeter-wave noise.
31. (original): The method of claim 29 further comprising:
- directing said millimeter and submillimeter noise from said frequency multiplier into a Fourier Transform Spectrometer; and
 - performing Fourier Transform Spectrometry on a test sample.
32. (original): The method of claim 29 further comprising characterizing materials using said millimeter- and submillimeter-wave noise.
33. (original): The method of claim 29 wherein said millimeter- and submillimeter-wave noise is continuous across the frequency range between about 60 to about 400 GHz.
34. (original): The method of claim 29 wherein said millimeter- and submillimeter-wave noise is continuous across the frequency range between about 60 GHz to about 1 THz.
35. (original): A noise generator comprising a means for generating noise, wherein said noise has a noise temperature greater than 2000°K and comprises one or more frequency bands in the range between 110 GHz to about 1.2 THz; and a transmission structure.
36. (original): The apparatus of claim 35, wherein said noise further comprises one or more

bands in the range between about 60 GHz to 110 GHz.

37. (original): The apparatus of claim 36, wherein said noise is continuous across a range of frequencies from about 60 GHz to about 1.2 THz.

38. (original): The apparatus of claim 35 wherein said means for generating said noise comprises: one or more frequency multiplier chains for converting microwave noise into said noise.